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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,360	09/19/2006	Saburou Yamagata	MOR-270-A	1223

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EXAMINER
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CHEN, CHRISTINE

ART UNIT	PAPER NUMBER
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1793

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08/29/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,360	<b>Applicant(s)</b> YAMAGATA ET AL.	
	<b>Examiner</b> CHRISTINE CHEN	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/08/06 and 4/14/08</u> .                                    | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-10, drawn to a cooling method of a metal part.

Group II, claim(s) 11, drawn to a cooling apparatus for a metal part.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The technical features which are common to both groups such as a means for cooling a metal part after the heating thereof by immersing the metal part in a cooling liquid and the application of a repeatedly varying pressure to a vapor film and breaking of the film without stirring the cooling liquid are all taught by Kazuo (JP 2000-239738). Since the limitations of the two groups fail to define a contribution over JP 2000-239738 they fail to constitute a special technical feature and hence there is a lack of unity between the cited claims.

3. During a telephone conversation with Mr. Andrew Basile Sr. on July 9, 2008 a provisional election was made with traverse to prosecute the invention of a cooling method of a metal part, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office action. Claim 11 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 3-4 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. The term "without the stirring" in claim 1 and claim 10 is a relative term which renders the claim indefinite. The term "without the stirring" in claim 1 and claim 10 is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear as to what forms of pressure applications are acceptable in terms of "applying a repeatedly varying pressure to a vapor film...wherein the vapor film is broken without the stirring of the cooling liquid." Moreover, claim 2 is said to further limit claim 1, which specifies that the repeatedly varying pressure is performed by applying oscillations to the cooling liquid. However, it would be reasonable for someone to interpret the application of oscillations to the cooling liquid as "stirring." Therefore the term "without the stirring" is a relative term which renders the claim indefinite. For purposes of examination, the phrase "without the stirring" excludes the stirring caused by a propeller or strong jet flow.

4. It is unclear what is meant by the phrase “changing a liquid-level pressure of the cooling liquid” in claims 3 and 4. It is unclear as to whether this phrase is to be interpreted as being changing the pressure on/over the cooling liquid or interpreted as being changing the pressure of the cooling liquid itself.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kazuo (JP 2000-239738).

Kazuo discloses a method of quenching a heated work piece by immersing said heated work piece in a quenching agent, wherein a vibration generating means 7 in the quenching agent has vertically vibrated blades 15, whose vibrations propagated by the quenching agent to the work piece allow for almost uniform removal of the vapor film on said work piece (see abstract, Field of the Invention section, [0010] and Figure 1 of Machine Translation). This reads on claims 1, 2, and 10 wherein the generation of vibrations of Kazuo is equivalent to the application of oscillations without stirring. The feature of a broken vapor film is implicitly taught in the almost uniform removal of the vapor film in the method of Kazuo. The step of heating a metal part as found in claim 10 is implicitly taught in the quenching of a heated work piece.

With regards to a step of changing a liquid-level pressure of the cooling liquid as recited in claims 3 and 4, as discussed above, Kazuo teaches an oscillatory three dimensional wave (repeatedly varying pressure) in the direction of a vapor film covering a work piece propagated through a quenching agent (see abstract and Field of the Invention section). It would be inherent in the application of repeatedly varying pressure in the form of a three dimensional wave to result in a change of the liquid level on top of the work piece and thereby change the liquid level pressure of the cooling liquid.

With regards to the use of multiple oscillators as recited in claim 5, in Figure 1 of Kazuo, there are 2 vibration generating means 7.

3. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Altshuler (SU 815048).

Altshuler discloses a quenching tank with a vibration generator to break down the vapor film around a component. When the quenching tank is in use, the component to be quenched 6 is lowered into the quenching agent 7 which also contains a vibration generator 2 comprising a vibrator 3 and an upper chamber containing gas 5. Given the arrangement wherein the vibrator 3 is situated within the quenching agent 7 and facing the component to be quenched 6 as shown in the Figure, Altshuler implicitly discloses a step of applying oscillations to the cooling liquid to break the vapor film. Moreover, given the arrangement wherein the upper chamber 5 contains gas and is a component of vibration generator 2 and has an open face away from the quenching agent as shown in the Figure, Altshuler implicitly discloses a step of changing the liquid level pressure of the cooling liquid wherein the amount of gas from the chamber is changed by the

vibration generator which is applied over the cooling liquid (see English abstract and Figure).

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Antonenko (SU 1470785).

Antonenko discloses a quenching unit for blanks. When the unit is in use, the oscillations imparted by a vibratory stand 4 move a casing 2 in a vertical plane. The pulsatory flows of the quenching liquid increase the hydrodynamic pressure in the liquid (change of liquid level pressure), wherein the vapor film on the blanks 6 is broken up by the pulsations (see English abstract and Figure).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo (JP 2000-239738).

With regards to the step of adjusting at least either of the amplitude and frequency of the oscillations as required by claims 6 and 7, Kazuo discloses a cooling method as discussed in paragraph 2 above. While Kazuo does not disclose a step of adjusting at least either of the amplitude and frequency of the oscillations according to the thickness of the vapor film or condition of the cooling liquid, it would have been

obvious to one of ordinary skill in the art to modify Kazuo's method to include such a step in order to remove a vapor film covering a work piece in an efficient manner.

7. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo (JP 2000-239738) combined with Saburo (JP 2003-286517).

With regards to the step of stirring the cooling liquid after the vapor film begins to be broken as recited in claim 8, Kazuo does not disclose such a step as shown in a description of Kazuo's method in paragraph 2 above.

Saburo, in teaching a quenching method, discloses jet stirring a liquid coolant after applying oscillations with a vibration stirrer 10 to said liquid coolant in order to break the vapor film (see abstract, claim 1, [0008] and [0044] of Machine Translation). The application of oscillations with a vibration stirrer 10 of Saburo is a functional equivalent to the application of oscillations to the cooling liquid without stirring taught by Kazuo. The diffusion of the bubbles in the cooling liquid would be inherent given the stirring step of Saburo.

It would have been obvious to one of ordinary skill in the art to add the stirring step of Saburo to the method of Kazuo in order to remove the vapor film of the liquid coolant formed on the processed material in a homogeneous manner. This is advantageous in allowing for the uniform quenching of the processed material.

With regards to a step of adjusting at least either of the intensity of the stirring and the direction of a flow generated by the stirring according to the condition of the cooling liquid and the condition of the metal part of the cooling liquid as required by claim 9, neither Kazuo nor Saburo disclose such a step in their quenching method as



discussed in paragraph 2 and 5 above. However, it would have been obvious to one of ordinary skill in the art to modify the method of Kazuo with the stirring of Saburo with a step of adjusting at least either of the intensity of the stirring and the direction of a flow generated by the stirring according to the condition of the cooling liquid and the condition of the metal part in the cooling liquid in order to remove a vapor film covering a work piece in an efficient manner.

8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo (JP 2000-239738) combined with Motoshige (JP 05-017817).

With regards to changing the liquid-level pressure of the cooling liquid as recited in claims 3 and 4, in the alternative, one may interpret Kazuo as not sufficiently teaching a step of changing a liquid-level pressure of the cooling liquid.

Motoshige, in teaching a method for quenching a metallic member, discloses a step of opening and closing an exhaust valve 16, an inert gas supply valve 18, and a leak valve 21 connected to a program controller 22 to change the pressure of the quenching room 2 over the cooling agent 9 (see abstract, Industrial Application section, Function section, [0012]-[0014] and Figures 1 and 2 of Machine Translation).

It would have been obvious to one of ordinary skill in the art to modify the method of Kazuo with the pressure step of Motoshige in order to facilitate hardening of the metallic member.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE CHEN whose telephone number is

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(571)270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

CC